

REMARKS

Claims 11-16, and 27-32 are at issue. Claims 1-10, and 17-26 have been canceled. No claims have been allowed.

The Examiner has objected to the Abstract. Applicant has deleted the Abstract and substituted a new, single paragraph abstract therefor on a separate sheet.

The Examiner had rejected claims 21-26. Applicant has canceled those claims.

Claims 11 and 27 have been rejected as anticipated by Dietz et al., U.S. Patent No. 4,452,642. Dietz et al. teaches a cleaning method which uses hydrogen gas (see column 2, lines 5-12) and thermally decomposing the hydrogen gas with a hot element at a temperature above 1300°C. At least part of the hydrogen molecules are converted into hydrogen atoms or ions. In Dietz et al's method, the heating element will not react with the hydrogen atoms or ions and the heating element is therefore not consumed by such gases, as opposed to the instant invention which uses a very corrosive gas.

Applicant has amended claims 11 and 27 whereby they now call for a cleaning gas containing at least one halogen atom. Applicant's specification supports this claim language, see for instance Applicant's specification, page 5, lines 14-17. Dietz et al. does not disclose the use of such gas. Applicant therefore submits that Dietz et al. does not anticipate nor render obvious Applicant's claimed invention.

Applicant notes that the Examiner has withdrawn the rejection of claims 11-16 as unpatentable over Matsuyama, U.S. Patent No. 5,149,375, in view of Niino et al., U.S. Patent No. 5,637,153, and further in view of Iwasaki et al., Japanese Patent No. 03-226578 A.

Claims 11, 12, 27, and 28 have been rejected under 35 U.S.C. 103(a) as unpatentable over Bluck et al., U.S. Patent No. 6,101,972, in view of Dietz et al., U.S. Patent No. 4,452,642, and Matsuyama, U.S. Patent No. 5,149,375.

Dietz et al. has been discussed hereinabove.

Bluck et al. teaches a plasma processing system and method. Bluck et al. does not correct the shortcomings of Dietz et al. pointed out hereinabove.

Matsuyama has been previously applied by the Examiner and discussed by Applicant (see the Amendment dated October 1, 2002). Matsuyama teaches activating gases for depositing a

film within a chamber rather than removing a deposited film with an activated gas. Thus, Matsuyama teaches away from Applicant's invention.

Matsuyama teaches that the filament material will be determined by taking into consideration the reactivity of the filament with various kinds of gases, heat resistance, etc. (see column 9, lines 33-37). Matsuyama further teaches that the material for his filament can be selected from a group of metals including platinum. However, in the specific examples provided by Matsuyama, only tungsten is described (see column 9, beginning at line 53).

In Example 4, the material of the filament is not described. In Example 5, although Si₂F₆ and GeF₄ gas generate an F-radical or F-activated species which is very corrosive to tungsten, a tungsten filament is still employed. As set forth in the instant specification, a tungsten filament will react with an F-radical or F-activated species and therefore gradually become thin, which will decrease the reproducibility and productivity of film formation. Applicant believes that tungsten is not suitable in a situation where a gas containing a halogen atom is used. Applicant therefore submits that Matsuyama would not have recognized that his tungsten filament is etched by a cleaning gas containing a halogen atom at a high temperature, nor that a platinum filament is not etched and is stable when used with such a cleaning gas.

Applicant respectfully submits that none of the cited references nor the combination thereof teaches Applicant's claimed invention. Furthermore, even if the cited references could be combined, the resulting structure would not anticipate nor render obvious Applicant's invention. Applicant therefore respectfully submits that claims 11, 12, 27, and 28 distinguish over and are not obvious in view of the cited references.

Claims 13, 14, 29, and 30 have been rejected under 35 U.S.C. 103 as unpatentable over Bluck et al., Dietz et al., Matsuyama, and Iwasaki et al. All these claims depend from either claim 11 or 27.

For the reasons given above, Applicant submits that those claims are also not anticipated by nor rendered obvious in view of the cited references.

Claims 15, 16, 31, and 32 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Bluck et al., in view of Dietz et al., Matsuyama, and Hatano et al. All these claims depend from claims 11 or 27. Applicant submits that the cited prior art does not cure the

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defect of Dietz et al. pointed out hereinabove. Applicant therefore submits that claims 15, 16, 31, and 32 distinguish patentably over the cited references and are not obvious in view thereof.

The Examiner has rejected claims 11-16 and 27-32 on the basis of the judicially created doctrine of obviousness-type double patenting over claims 1-12 of U.S. Patent No. 6,375,756 in view of Matsuyama, U.S. Patent No. 5,149,375.

Applicant submits herewith a Terminal Disclaimer. U.S. Patent No. 6,375,756 is commonly owned with the instant application. Applicant therefore respectfully submits that claims 11-16 and 27-32 are patentable over the cited prior art references.

In view of the foregoing, Applicant respectfully submits that the claims at issue distinguish patentably over and are not obvious in view of the cited references and respectfully request that a Notice of Allowance be issued in this case.

In the event Applicant has overlooked the need for an additional extension of time, payment of fee, or additional payment of fee, Applicant hereby petitions therefore and authorizes that any charges be made to Deposit Account No. 02-0385, Baker & Daniels.

Should the Examiner have any further questions, he is respectfully invited to telephone the undersigned at 260-460-1695.

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Enclosure:

- Petition For Extension Of Time
- Check No. 108639 + 108643
- Terminal Disclaimer
- Postcard

ABSTRACT

A method for efficiently and completely removing a film deposited inside a vacuum chamber. The chamber is first exhausted. A hot element, at least the surface of which is composed of platinum, is disposed in the chamber, and is heated to a prescribed temperature. A cleaning gas is introduced into the chamber and is decomposed and/or activated by the hot element to generate an activated gas that converts the deposited film into a gaseous substance.